(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
10 February 2005 (10.02.2005)

PCT

(10) International Publication Number
WO 2005/012948 A3

(51) International Patent Classification[7]: G02B 27/42, 5/18

(21) International Application Number:
PCT/IL2004/000726

(22) International Filing Date: 4 August 2004 (04.08.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/491,996 4 August 2003 (04.08.2003) US

(71) Applicant *(for all designated States except US)*: **YISSUM RESEARCH DEVELOPMENT COMPANY OF THE HEBREW UNIVERSITY OF JERUSALEM** [IL/IL]; Hi Tech Park, The Edmond J. Safra Campus, The Hebrew University of Jerusalem, Givat Ram, 91 390 Jerusalem (IL).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **AGRANAT, Aharon, J.** [IL/IL]; 29 HaArazim Street, 90 805 Mevasseret Zion (IL). **DE OLIVEIRA, Clovis, Eduardo, Mazzotti** [IL/IL]; 29 Bar Nisan Street, 84633 Beer Sheva (IL).

(74) Agent: **G.E. EHRLICH (1995) LTD.**; 11 Menachem Begin Street, 52 521 Ramat Gan (IL).

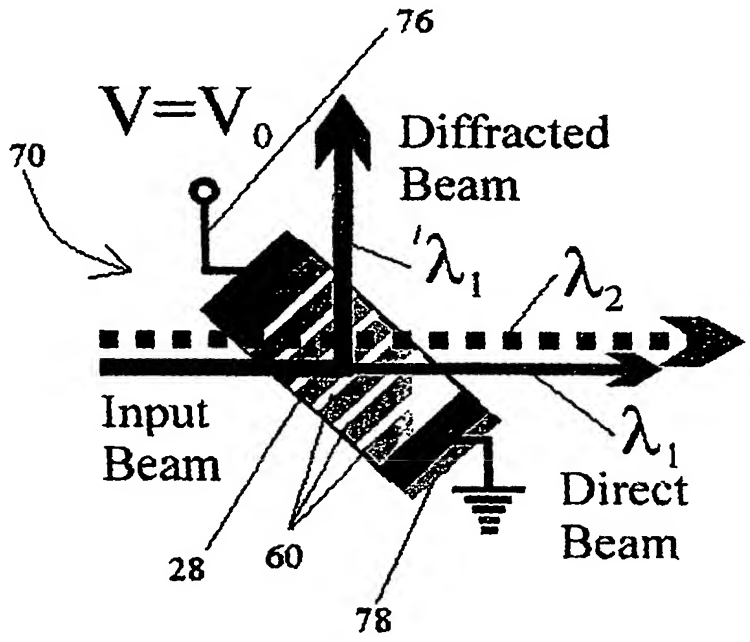
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

[Continued on next page]

(54) Title: STABLE DIELECTRIC GRATINGS IMPLEMENTED BY COMPOSITION STRIATIONS IN PARAELECTRIC CRYSTALS



(57) Abstract: Methods for permanently introducing patterns in electro-optic crystals are provided, by forming patterned variations in the composition of the electro-optic crystals (28), during the crystal growth process. These methods open a way to a family of light-controlling devices that can operate at temperatures as high as 80 degrees centigrade, and may be stored at temperatures as high as 300 degrees centigrade. Additionally, they may withstand radiation of natural light and cosmic ray. In accordance with one embodiment, an electrically (76) controlled Bragg grating is introduced into a crystal, by a permanent periodic spatial variation (60) of its composition, forming permanent periodic striations. The periodic striations induce a spatial modulation of the dielectric constant, and the application of a uniform electric field produces an induced polarization grating.

WO 2005/012948 A3

(88) Date of publication of the international search report:
21 April 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.